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of the psychology of relation, finds mention. As for the exposition itself, I can only refer the reader to it. I hold in opposition to Dr. Schrader that the "relation" is logical, not psychological, but that it *can* be ideated (pp. 37 ff.), as every concept can. It is impossible here to justify this view at the necessary length.

In Chapter IV. is treated the relation between conscious relation and association. Association assists and prepares the way for relation; it is determined by the relation, and the latter is, in cases, resolved by it. In other words, the conscious relation stands to association very much as Wundt's apperceptive combination stands to it. Chapter V. discusses the views of some other psychologists: (1) Of the Herbartians and Münsterberg (doctrine of inhibition of ideas); (2) of von Hartsen; (3) of Stumpf (doctrine of relativity). Chapter VI. asks whether the conscious relation can serve to explain judgment. This question will be fully answered in the author's forthcoming *Analyse des Urtheils*.

If we take exception to Chapter III., it is unnecessary to criticise the superstructure raised upon it. While (as already said) I am in almost complete disagreement with Dr. Schrader on many points, I believe that his work is an honest effort to clarify our notions of the relation in which logic and psychology stand to one another. His further publications cannot but be interesting. E. B. T.

Warum müssen wir schlafen? Eine neue Theorie des Schlafes. DR. MED. EMANUEL ROSENBAUM. 1892, 58 pages.

The new theory is to be classed with those which attribute fatigue and sleep chiefly to the toxic products formed during activity. The author endeavors to show that the phenomena of sleep can be accounted for by the formation in the nervous system, and deficient elimination, of water, which is to be looked upon as a noxious waste product.

The theory is introduced by a synopsis of some of the facts of nervous and muscular activity and a sketch of the various theories of sleep from the time of Alkmæon, 585 B. C., to the present. The reference to current theories is, however, very meager, and only that of Preyer is mentioned.

The new theory finds its support in a study of the anatomical conditions of the nervous system in diseases like scarlet fever, abdominal typhus, acute atrophy of the liver, meningitis tuberculosa, etc., which are characterized by a tendency to sleep.

The symptoms and anatomical details are taken from Ziemesson's hand-book. In all cases there is a dropsical condition of the nervous system to which the author attributes the mental disturbances, especially the abnormal tendency to sleep.

Another line of evidence is found in the statements of Schiff, Harless and Ranke, that the excitability of a nerve diminishes with the increase of water in it.

As to the source of the water, some may exude from the veins and arteries, but it comes chiefly from the chemical changes in the tissues. The water eliminated by the kidneys and sweat glands comes from the arterial, that of the lungs from the venous blood. The amount of aqueous vapor exhaled is not affected by the amount taken into the stomach, but by the amount of work done. The venous blood carries away the water formed by oxydation in the tissue metabolism. The principle of hydrodiffusion applies to its elimination. The percentage of water in the venous blood is less than in the tissues, hence they will be drained by it. The water removed by respiration is the only part of interest for the theory.

A study of the tables of Pettenkoffer and Voit shows that more water relatively to the amount of oxygen inhaled is expired during the night than during the day. The conclusion is drawn that elimination does not keep pace with formation, and that muscles must rest and the brain sleep to enable the organism to remove the accumulating surplus of water. Normal sleep is produced by the increase of water in the nerve cells. Some nerve tracts are less soaked than others and recover more quickly, hence partial cerebral activity and dreams. The winter and summer sleep of animals is said to be due to the presence of relatively greater amounts of aqueous vapor in the air, which hinders its elimination by the lungs. "Intelligence is in inverse ratio to the percentage of water in the brain and is to be measured by it, at least in the case of children."

In criticism, it may be said that other toxic products of activity, like lactic acid, urea, choline and neurine, etc., have a respectable claim to attention; that, like other theories of its class, it fails to notice the significance of the exhaustion of cell materials, which Hodge has shown to take place in normal cell activity; that it is by no means certain that the lymph which fills the spaces of the contracted cells is harmful, or that there is any noxious formation of water in nerve fibers, which Bowditch and Edes have shown to be practically unfatigable; and that it fails to notice the primary influence of habit and inhibition upon sleep, which makes sleep not simply a problem of physiology, but also of psychology.

BERGSTRÖM.

La Mémoire. J. J. VAN BIERVLIET, Professeur à l'Université de Gand. 1893, 40 pages.

The author gives a sketch of a theory of memory. He discusses briefly the modern views of the physical basis of memory; that it is the persistence of a movement, of a trace, or of a tendency to movement, in the nervous system. He believes Sergi's objection to the first theory, that the persistence of movements would bring on excessive fatigue and interfere with subsequent impressions, is valid. His own theory is a combination of the last two views, and is represented by the phrase *trace-disposition*. The theory is repeatedly illustrated by this figure: If we attach a weight to a wire of length L , which stretches it to the length $L + A$, and then remove it, the wire does not return to its original length L unless perfectly

elastic, but suffers a permanent modification $\frac{X}{A}$. A less weight will

later produce the elongation $L + A$, which represents the degree of excitation of the nerve cells required for consciousness. Retention depends upon the plasticity of the nervous system, which this figure typifies. Contiguity and succession are the laws of reproduction. Their physiological basis is the *trace-disposition* formed by the attention, which is essentially a nervous movement or excitation proceeding from one to another of simultaneous or successive impressions. Recognition, which is the essence of memory considered as a faculty of the soul, depends also upon the *trace-disposition*. Ideas which are recalled are characterized by an ease and facility which new impressions do not have. The basis of localization in the past is the degree of completeness and vividness of recalled images. The pathology of memory includes two groups of cases, hypermnesias and amnesias. These are due to physiological influences which weaken or excite the nervous tissue, just as